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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/772,662	01/30/2001	Hideaki Yoshida	01047/ LH	2206

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EXAMINER

AGGARWAL, YOGESH K

ART UNIT	PAPER NUMBER
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2615

DATE MAILED: 08/12/2004

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Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/772,662

Applicant(s)

YOSHIDA, HIDEAKI

Examiner

Yogesh K Aggarwal

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-30 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 28, 30 is/are allowed.
- 6) ☒ Claim(s) 1-4, 7-9, 16-20, 27 and 29 is/are rejected.
- 7) ☒ Claim(s) 5, 6, 10-15 and 21-26 is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 30 January 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
- 1) ☒ Certified copies of the priority documents have been received.
 - 2) ☐ Certified copies of the priority documents have been received in Application No. ____.
 - 3) ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date ____.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: ____.

Claim Rejections - 35 USC § 102

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

1. Claims 1, 7, 16, 17, 27, 29 are rejected under 35 U.S.C. 102(b) as being anticipated by Sudo et al. (US Patent # 5,272,536).

[Claim 1]

An imaging apparatus comprising an imaging device (figures 1 and 2, elements 1R, 1G, 1B) element having a plurality of pixels arranged in a two-dimensional fashion (col. 6 lines 10-16), dark output level detecting means (figure 1, element 27) for detecting a dark output level for each pixel superposed on an imaging signal which is an output signal of said imaging device (col. 8 lines 24-30) and dark output correction means (figure 1, element 3) for correcting the imaging signal based on the dark output level detected by said dark output level detecting means (col. 6 lines 64-68, col. 7 lines 1-10, col. 12 lines 6-16) and setting a clip level (figure 4, element 31) for a subject component of the imaging signal according to the dark output level detected by said dark output level detecting means (col. 8 lines 36-44, col. 9 lines 3-33).

[Claim 7]

An imaging apparatus comprising an imaging device (figures 1 and 2, elements 1R, 1G, 1B) element having a plurality of pixels arranged in a two-dimensional fashion (col. 6 lines 10-16), dark output level detecting means (figure 1, element 28) for detecting a dark output level for each pixel superposed on an imaging signal which is an output signal of said imaging device (col. 8 lines 24-30) and dark output correction means (figure 1, element 3) for correcting the imaging signal based on the dark output level detected by said dark output level detecting means (col. 6 lines 64-68, col. 7 lines 1-10) and setting an effective gain for a subject component of the

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imaging signal according to the dark output level detected by said dark output level detecting means (col. 12 lines 6-16).

[Claim 16]

The examiner notes that the process of controlling gains of the variable gain amplifiers 9R, 9G, 9B of the correction circuit 3 by the correction circuit 3 in order to reduce the dark current correction errors as disclosed in col. 12 lines 6-16 is being used for exposure correction.

[Claim 17]

An imaging apparatus comprising an imaging device (figures 1 and 2, elements 1R, 1G, 1B) element having a plurality of pixels arranged in a two-dimensional fashion (col. 6 lines 10-16), dark output level detecting means (figure 1, element 28) for detecting a dark output level for each pixel superposed on an imaging signal which is an output signal of said imaging device (col. 8 lines 24-30) and dark output correction means (figure 1, element 3) for correcting the imaging signal based on the dark output level detected by said dark output level detecting means (col. 6 lines 64-68, col. 7 lines 1-10, col. 12 lines 6-16) and setting a clip level (figure 4, element 31) for a subject component of the imaging signal according to the dark output level detected by said dark output level detecting means (col. 8 lines 36-44, col. 9 lines 3-33) and setting an effective gain for a subject component of the imaging signal according to the dark output level detected by said dark output level detecting means (col. 12 lines 6-16).

[Claim 27]

Grounds for rejecting claim 16 apply for claim 27 completely.

[Claim 29]

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This is a method claim corresponding to apparatus claim 17. Therefore it has been analyzed and rejected based upon the apparatus claim 17.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 2, 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sudo et al. (US Patent # 5,272,536) in view of Van der Valk (US Patent # 6,028,628).

[Claim 2]

Sudo et al. teaches dark current correction means and clip level setting means as specified in claim 1 but fails to teach “setting the clip level based on the maximum value of the dark output level detected”. However Van der Valk discloses that clipping values can be set based upon the maximum value of the measured pixel values for pixels having a dark current (col. 2 lines 38-46). Therefore taking the combined teachings of Sudo and Van der Valk, it would have been obvious to one skilled in the art at the time of the invention to have been motivated to have set the clip level based on the maximum value of the dark output level detected in order to remove the dark current noise. The benefit of doing so would be that each number and each value of single-pixel deviations could be corrected as taught in Van der Valk (col. 2 lines 40-41).

[Claim 18]

Grounds for rejecting claim 2 apply for claim 18 completely.

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4. Claims 3, 4, 8, 9, 19, 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sudo et al. (US Patent # 5,272,536) in view of Yamagishi (US Patent # 6,710,808).

[Claim 3]

Sudo et al teaches a test imaging means for performing a charge storage and readout operation of said imaging device in a state where exposure to said imaging device is shielded and in which detection of the dark output level in said dark output detecting means is effected by deriving a dark output level (col. 8 lines 24-30). Sudo et al. fails to teach that the dark output level at the actual imaging time is based on test imaging time of said test imaging means, an imaging device output level obtained by said test imaging means and charge storage time for exposure control at the actual imaging time. However Yamagishi teaches that dark output level at the actual imaging time is based upon test imaging time of said test imaging means, an imaging device output level obtained by said test imaging means and charge storage time for exposure control at the actual imaging time (col. 11 lines 24-40). Therefore taking the combined teachings of Sudo and Yamagishi, it would have been obvious to one skilled in the art at the time of the invention to have been motivated to have the dark output level at the actual imaging time is based upon test imaging time of said test imaging means, an imaging device output level obtained by said test imaging means and charge storage time for exposure control at the actual imaging time. The benefit of doing so would be so that the sensed image data can be corrected for image quality deterioration such as pixel omission or the like caused by dark current noise produced by the image sensing element and scratches unique to the image sensing element as taught in Yamagishi (col. 11 lines 35-40).

[Claim 4]

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Yamagishi teaches test imaging time and the charge storage time at the actual imaging time are set equal to each other and the imaging device output level obtained by said test imaging means is derived as the dark output level at the actual imaging time (col. 11 lines 24-40).

[Claim 8]

Grounds for rejecting claim 3 apply for claim 8 completely.

[Claim 9]

Grounds for rejecting claim 4 apply for claim 9 completely.

[Claim 19]

Grounds for rejecting claim 3 apply for claim 19 completely.

[Claim 20]

Grounds for rejecting claim 4 apply for claim 20 completely.

Allowable Subject Matter

5. Claims 5, 6, 10-15, 21-26 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

6. The following is a statement of reasons for the indication of allowable subject matter:

a) As for claim 5, 10 and 21 the prior art of record does not teach or fairly suggests test imaging time and the charge storage time at the actual imaging time are different from each other and the dark output level at the actual imaging time is derived by multiplying the imaging device output level X obtained by said test imaging means by a ratio Y/Z of the test imaging time Y of said test imaging means to the charge storage time Z for exposure control at the actual imaging time.

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b) As for claim 12, 23 the prior art of record does not teach or fairly suggests a value of the effective gain set by said dark output correction means is determined based on a resultant value obtained by dividing "a value corresponding to the saturation level on the output side of said dark output correction means" by a difference between "a value corresponding to the saturation level on the input side of said dark output correction means" and "the maximum value of the dark output level detected by said dark output level detecting means".

7. Claims 28 and 30 are allowed.

8. The following is a statement of reasons for the indication of allowable subject matter:

c) As for claims 28 and 30 the prior art of record does not teach or fairly suggests an imaging apparatus comprising setting an effective gain for the corrected imaging signal according to the set clip level; and controlling exposure of the imaging device according to the set gain.

Conclusion

9. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

- i. Katoh et al. (US Patent # 5,796,430).
- ii. Zhou et al. (US Patent # 2002/0001416).
- iii. Kim (US Patent # 5,245,439).
- iv. Itani et al. (US Patent # 6,650,364).

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Yogesh K Aggarwal whose telephone number is (703) 305-0346.

The examiner can normally be reached on M-F 9:00AM-5:30PM.

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10. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Andrew Christensen can be reached on (703) 308-9644. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

11. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

YKA

July 28, 2004


TUAN HO
PRIMARY EXAMINER